

PROJECT PROCUREMENT METHOD: THE CONFLICTS IN CONSTRUCTION
PROJECTS PROCURED UNDER DESIGN AND BUILD METHOD

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ABSTRACT

Design and build procurement method is one of the procurement methods where the contractor is responsible to carry out both the design and construction work of the project. Design and build contract give convenience to the client by combining project cost, schedule, design and quality into one single point of responsibility. Even though, design and build contract give many benefits to contractor and client but there are contractors and clients who still feel less excited with the benefits offered. The number of projects procured under design and build method are also decreasing in recent years. Therefore, this research purpose is to identify the conflicts in design and build construction project and propose the solution to overcome the conflicts in design and build contract. A research questionnaire was designed and distributed to 92 grade 7 contractors in Pahang state. The data obtained from respondents were analyzed using mean value analysis. The result of the survey indicated that five mostly occurred conflicts in design and build projects are variation order, delay in work activities, client delay (lack of payment), client lack interaction with contractor and time overrun or project delay. By referring to the literature review, contract form (Standard Form of Design and Build Contract – PWD Form DB (Rev.1/2010), Standard Form of Contract Be Used Where Drawings and Specifications Form Part of the Contract – PWD Form 203 (Rev. 1/2010) and Agreement and Conditions of PAM Contract 2006 with Quantities and interview with two experts from Perbadanan Kemajuan Negeri Pahang (PKNP) which are an engineer and an quantity surveyor, five solution flowcharts was proposed to overcome the five mostly occur conflicts in design and build projects. The result of this research will help the construction team, design team and client of design and build projects to systematically and effectively manage their conflicts and indirectly will help them in maintaining their good relationship. In the future study, it is proposed for the future researcher to increase the number of respondent by expanding the scope of study. When the scope of study is bigger, the researcher can know the various types of conflicts and propose a more accurate solution to overcome the conflicts.

ABSTRAK

Kaedah perolehan reka and bina adalah salah satu kaedah perolehan di mana kontraktor bertanggungjawab untuk melaksanakan kedua-dua kerja reka bentuk dan kerja pembinaan bagi sesebuah projek. Kontrak reka dan bina memberi kemudahan kepada klien dengan menggabungkan kos projek, jadual kerja, reka bentuk dan kualiti menjadi satu skop tanggungjawab. Walaupun kontrak reka dan bina menawarkan banyak faedah kepada kontraktor dan klien, masih ada kontraktor dan klien yang kurang berminat dengan manfaat yang ditawarkan dan bilangan projek yang menggunakan kontrak reka dan bina semakin berkurangan. Oleh sebab itu, kajian ini bertujuan untuk mengenalpasti konflik di dalam projek reka dan bina dan mencadangkan cara penyelesaian untuk mengatasi konflik di dalam projek reka dan bina. Satu soal selidik telah dibuat dan diedarkan kepada 92 firma kontraktor gred 7 di negeri Pahang. Kemudian, data yang diperolehi daripada responden dianalisis dengan menggunakan analisis nilai purata. Keputusan kaji selidik telah menunjukkan lima konflik yang paling kerap berlaku di dalam projek reka dan bina iaitu arahan perubahan kerja, kelambatan dalam aktiviti kerja, kelewatan klien dalam pembayaran, klien kurang berinteraksi dengan kontraktor dan kelambatan projek. Dengan merujuk kepada kajian literatur, borang kontrak (Borang Kontrak Reka dan Bina- Borang JKR DB (Rev.1 / 2010), Borang Kotrak JKR 203 (Rev. 1/2010) dan Perjanjian & Syarat Kontrak PAM 2006 dan temuduga 2 pakar dari Perbadanan Kemajuan Negeri Pahang (PKNP) iaitu Jurutera dan Juruukur Bahan, lima carta aliran untuk penyelesaian konflik telah dicadangkan bagi mengatasi lima konflik yang paling kerap berlaku di dalam projek reka dan bina. Hasil kajian ini dapat membantu pihak pembinaan, pihak reka bentuk dan klien dalam menyelesaikan konflik dengan cara yang bersistematik dan berkesan dan secara tidak langsung dapat mengekalkan hubungan yang baik antara pihak yang terlibat. Untuk kajian pada masa depan, penyelidik perlu meluaskan skop dengan meningkatkan jumlah responden. Apabila skop kajian semakin besar, penyelidik dapat mengetahui pelbagai jenis konflik dan mencadangkan penyelesaian yang lebih tepat untuk mengatasi konflik tersebut.

TABLE OF CONTENT

	Page
SUPERVISOR'S DECLARATION	ii
STUDENT'S DECLARATION	iii
DEDICATION	iv
ACKNOWLEDGEMENT	v
ABSTRACT	vi
ABSTRAK	vii
TABLE OF CONTENTS	viii
LIST OF TABLES	xii
LIST OF FIGURES	xiii
LIST OF ABBREVIATIONS	xiv

CHAPTER 1 INTRODUCTION

1.1	Introduction	1
1.2	Problem Background	2
1.3	Problem Statement	4
1.4	Research Objective	5
1.5	Research Question	5
1.6	Project Scope	5
1.7	Significance Of Study	6
1.8	Operational Definition	6
	1.8.1 Procurement	6
	1.8.2 Design and Build Method	6
	1.8.3 Conflict	7
1.9	Expected Result	7
	Expected Result for Objective 1	7
	Expected Result for Objective 2	7
1.10	Conclusion	7

CHAPTER 2 LITERATURE REVIEW

2.1	Introduction	8
2.2	Procurement	8
	2.2.1 Procurement Process	10
2.3	Procurement Method	11
	2.3.1 Traditional / Conventional Procurement Method	12
	2.3.2 Design and Build Procurement Method	13
	2.3.3 Management Contracting Method	14
	2.3.4 Construction Management Procurement	15
2.4	Design and Build Method	16
	2.4.1 Design and Build Method Structure / Contractual Relationship	18
	2.4.2 Design and Build Framework and Operation	20
	2.4.3 Advantages Of Design And Build Method	21
	2.4.4 Disadvantages of Design and Build Method	22
2.5	Conflict	23
	2.5.1 Category of Conflict	24
2.6	Conflicts Associated With Design and Build Procurement	25
2.7	Conclusion	31

CHAPTER 3 RESEARCH METHODOLOGY

3.1	Introduction	32
3.2	Research Design	32
3.3	Research Method	35
3.4	Population and Sampling	35
3.5	Data Collection Techniques	36
3.6	Development of Measure: Design of Questionnaire	37
3.7	Data Analysis Method	37
3.8	Conclusion	38

CHAPTER 4 DATA COLLECTION AND ANALYSIS

4.1	Introduction	39
4.2	Pilot Test	40
4.3	Reliability of Measurement	40
4.4	Descriptive Analysis	41
4.5	Mean Value Analysis	44
4.6	Conflict's Solution Flowchart	46
4.6.1	Solution Flowchart for Variation Order or Request Change from Client	46
4.6.2	Solution Flowchart for Delay in Work Activities	49
4.6.3	Solution Flowchart for Client Delay (Lack of Payment)	52
4.6.4	Solution Flowchart for Client Lack Interaction with Contractor	55
4.6.5	Solution Flowchart for Time Overrun / Project	57
4.7	Conclusion	59

CHAPTER 5 CONCLUSION AND RECOMMENDATION

5.1	Introduction	60
5.2	Discussion	60
5.3	Limitation of Study	62
5.4	Recommendation for Future Study	63
5.5	Conclusion	63

REFERENCES	64
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APPENDICES

A	Gantt chart for FYP 1 and FYP 2	68
B	Number of Projects Procured Under Design and Build Contract (Year 2012-2014)	70
C	Table for Determining Sample Size from a Given Population	71
D	Survey Questionnaire	72

E	Interview Questions	76
F	Pilot Test	78
G	Reliability Test	80
H	Mean Value Analysis	82
I	Faculty Formal Letter & Respondent Cop	84

LIST OF TABLES

Table No.	Title	Page
2.1	Conflict Associated with Design and Build Method	27
2.2	Conflict Associated with Design and Build Method	28
2.3	Conflict Associated with Design and Build Method	29
2.4	Conclusion of Conflict Associated with Design and Build Method	30
4.1	Reliability Statistics for Pilot Test	40
4.2	Reliability Statistics for Reliability Test	40
4.3	Ranking of Conflicts in Design and Build Projects	44

LIST OF FIGURES

Figure No.	Title	Page
2.1	Design and Build Structure / Contractual Relationship	19
2.2	Organizations and Management Structure of Design and Build Method	19
2.3	Design and Build Method Framework and Operation	20
3.1	Research Design Framework	36
4.1	Position of Respondent	41
4.2	Types of Company	42
4.3	Company Operation period	43
4.4	Solution Flowchart for Variation Order or Request Change from Client	47
4.5	Solution Flowchart for Delay in Work Activities	50
4.6	Solution Flowchart for Client Delay (Lack of Payment)	53
4.7	Solution Flowchart for Client Lack Interaction with Contractor	56
4.8	Solution Flowchart for Time Overrun / Project delay	58

LIST OF ABBREVIATIONS

CIDB	Construction Industry Development Board
DB	Design and Build
EOT	Extension of Time
JKR	Jabatan Kerja Raya
LAD	Liquidated and Ascertained Damages
MBAM	Master Builders Association Malaysia
PAM	Persatuan Arkitek Malaysia
PD	Project Director
PM	Project Manager
PWD	Public Work Department
QS	Quantity Surveyor
SO	Superintending Officer
SPSS	Statistical Package for Social Science
VO	Variation Order

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Construction is a process which thing is constructed. It involves the process of converted owner's idea or concept into physical structures and facilities. In addition, construction process included organization and management of all resources such as manpower, raw materials, machinery, method and money to complete the project within time and budget and should according to the standard of quality (Babatunda et al., 2010). The contractor and client are played important roles in construction process. Contractor is a group or individual that responsible to executed construction for client and while client is owner of the project.

The construction project should be perfectly and systematically managed in order to achieve the good quality of final product. One of the most important management in construction project is project procurement management. According to PMBOK (2008), project procurement is a process which client purchase goods or services from outsides the company. In construction management, procurement process is method whereby the client searching, finding and contracting contractor or someone with professional skill to perform the project.

Choosing the right project procurement method is important for project complete success of the project. Nowadays, there are several types of project procurement method for client to choose based on their own needs. According to

Building C. I. (2011), the construction procurement method can be classified into four types, which are traditional/conventional method, design and build method, management contracting and construction management.

Traditional/conventional method also known as separated and co-operative system. The main characteristic of traditional method is design and construction works are separate and will responsible by different firm. In this type of system, architect will full responsible for design work of the project and design will be done before tender process for contractor begins. Other than that, architect also will act as consultant of client in supervise the construction process and protect the interest of client (Masterman, 1992).

However, the main characteristic of design and build method is one organization/firm is responsible for both design and construction work. Therefore, there have only one main contract between the client and main contractor for use as reference. This system seems to be popular in construction industry in nowadays because provide shorten project completion duration, high quality of end product and can early know about the project cost. Because contractor responsible for all aspect in project, therefore it convenience for client to estimate their total cost of the project. Design and build method also known as integrated procurement system (Masterman, 1992).

Management contracting method and construction method can be categorized into management-oriented procurement system. The entire process of this system will be managed by contracted consultant. Normally, consultants will performed their function or responsibility under the supervision of client. The consultants will manage the overall process of the project by focus on the construction aspects (Masterman, 1992).

1.2 PROBLEM BACKGROUND

The nature of construction industry has changed greatly in recent years because construction project become more complex and more emphasize on management and technical skills. Other than that, project's client also request for shorter project delivery

time and request contractor to early show the total project cost at the initial stage of project. According to Rashid K. A. (2002), in Malaysia, the traditional procurement system is most frequently used because it allow fixed price in complex construction and architect have full responsible in design work. But the implemented of traditional procurement method was found not suitable to current demands; traditional procurements method required more time to complete the project and also encourage adversary between stakeholders. This situation led to increase in the use of design and build method (Yusof A, 2006). By using the design and build method, the conflict associated to traditional procurement method can be solved. For example, design and build method can use to overcome the fact that different parties are responsible to different works which is design work and construction work.

Nowadays in Malaysia, design and build method become an alternative method to traditional procurement method either in public sector or private sector. Design and build method give the better performance when compared to others contract and procurements methods. According to Yusof A. (2006), design and build method is beneficial to all stakeholders such as project's client, contractors, architects and engineers. By using the design and build method, design work and construction work could be performed by one company at the same time. Therefore, client need only have a single agreement with one contractor who agree to performe both design and construction work.

According to Yusof A., (2006), project's client interest to design and build method because it provides a single source of responsibility. Client no need liabe for defect that caused by error in design or construction work. The contractor have single responsibility toward defects of error and contruction work. Other than that, contractor also need to responsible for any additional cost that associated to defective or inadequate plans by contractor. In addition, the design and build method may result in lower the total project cost because contractor have high control over in the project.

According to Majid M. A. (2007), atthough design and build method bring many benefit to client but it also have some drawbacks. The final product may not satisfied the client needs and specifications performance because client have limited in the input

of detailed design. In addition, client also have less control toward the construction work and the cost of any variation orders required (Malconlaw, 2014). Furthermore, the design and build contract have a very costly tender process. It is difficult for client to make decision or comparison of prices between the contractors because their design is differ. When the detailed checking of design and specification is needed, the long-term cost of tender process will increased because client need person who have expertise and professional skill to check the project cost and design criteria.

1.3 PROBLEM STATEMENT

The design and build contract is a substitute to the traditional procurement method because successful design and build contract can add value to the project and bring many benefits to the client. Design and build contract give convenient to the client by combine project cost, schedule, design and quality into one single point of responsibilities. By using the design and build contract, it can improved the project quality because contractor will engage with design team to achieved the client requirement.

Some clients and contractor are less excited with the benefits offer by design and build contract because if compare to traditional method, clients have less control and influence to the design matters and inflexibility in makes change. While, contractor need to responsible for both design and construction of the project as different to traditional method which the client will assign different parties such as architect to performed design work. In addition, the number of projects procured under design and build method decreasing from March 2012 to March 2014, CIDB (2014).

When the clients have less control and influence in their project, they may unsatisfy with the finished product. High risk will more on the contractor when clients more demand on design work. Other than that, if the contractor need to responsible for both design and construction work they need to liability to all risk resulting from design and construction work in order to complete the project. It is very different to traditional method, which risk from design work will liability by architect.

Investigating and finding the problem in project procured under design and build method may attract the contractors and clients to use the design and build method in their project. Contractors and client may more interested with the benefits offer by design and build contract compare to traditional method when have the solution to overcome the conflict. Therefore, this research is proposed to investigate the conflict of design and build method and propose the solution to overcome the conflict.

1.4 RESEARCH OBJECTIVE

Research Objective 1: To identify the conflicts in design and build construction projects.

Research Objective 2: To propose the solution to overcome the conflict in design and build construction projects.

1.5 RESEARCH QUESTION

Research Question 1: What are the ranking of each conflict in design and build construction projects?

Research Question 2: How to overcome the conflicts in design and build construction projects?

1.6 PROJECT SCOPE

This study will focus on the construction company in one of the east coast state in Malaysia which is Pahang. The company should be the construction company that registered as contractor Grade 7 with Construction Industry Development Board (CIDB). According to CIDB (2013), contractor Grade 7 is a private limited company (Sdn Bhd) or limited company (Syarikat Berhad) that has paid up capital about RM750, 000.00 or sole proprietorship/partnership in the form of bank statement for last 3 month that have capital accumulation about RM750, 000.00. In addition, cost of work/tender for contractor Grade 7 should more than RM10, 000,001.00. The technical personnel of

contractor Grade 7 should have construction personnel registration card that is still valid and should either have 2 degree holders technical personnel or 1 degree holder and 1 diploma holder technical personnel. The respondents should be the company director, project manager, engineer, architect or quantity surveyor of the company.

1.7 SIGNIFICANCE OF STUDY

The major purpose of this research is to gain more knowledge about design and build method in project procurement management. Besides that, this research also uses to know the ranking of each conflict in design and build construction projects because nowadays many problems occur in project procurements system of construction project. This research can help the parties involved such as contractor, client, design team and construction team to determine the conflicts that frequently occur in design build construction projects.

By having the solution to overcome the conflicts in design and build construction project. It can help the parties involved such as contractor, client, design team and construction team to confidently face with the conflict and can systematically and effectively manage their conflict. Indirectly, they also can maintain a good relationship between parties involved. Furthermore, this research can be used as a guideline for construction company in future improvement and manage the conflict systematically.

1.8 OPERATIONAL DEFINITION

1.8.1 Procurement

Procurement is a process of purchasing goods or services from outside companies. The organization can be either seller or buyer of the product and services (PMBOK, 2008).

1.8.2 Design and build method

Design and build method is a project procurement method in which contractor is responsible for both design work and construction work. Client can directly deal with the contractor for the complete building.

1.8.3 Conflict

Conflict is an expressed struggle or disagreement of people or group in the project. Normally, conflict will occur within two or more parties that have different level or position and believed there is a threat to their interest, need and concern.

1.9 EXPECTED RESULT

1.9.1 Expected Result for Objective 1

After identify and rank the conflicts in design and build construction projects, the construction company can easily determine the conflicts that may occur between the parties' involve in design build construction projects. For instance, time issue, administrative issue, technical issues, resources issue, cost issue and others. It will be presented in ranking table.

1.9.2 Expected Result for Objective 2

By propose solution to overcome conflict in design and build construction project, the construction company can systematically and effectively manage their conflicts that frequently occurs and indirectly can help the parties involves in maintain a good relationship. The conflict's solution will be proposed in form of solution process flow.

1.10 CONCLUSION

In Chapter 1 Introduction, all basic information about the research title was discussed. In this chapter, problem statement and research questions are carried out to generate the research objectives. Research scope, significance of study and expected result also was discussed. In the next chapter which is Chapter 2 Literature Review, all information related to research title will be discussed.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Chapter 2 explained about the relevant literature that had related to the research title. Therefore, the elaboration about the research title will be clearly defined. The literature review will focused on the contract, procurement, contract and procurement method and the common conflicts in design and build construction projects.

2.2 PROCUREMENT

Procurement can be describe as the process of purchasing good or services from an outside the organization (Schwalbe K., 2013). Usually, term procurement will use in government sector; while, private sector will use term purchasing or outsourcing to describe the action buying product or services. Schwalbe K. (2013) stated the person or organizations that provide procurement service is such as contractors, subcontractors, sellers, suppliers, vendors and others. The contractors, subcontractors, sellers, suppliers and vendors are usually will provide product and services or work for person called client (owner of project).

In the construction project, procurement process is representing the effort of client in obtaining efficient construction product and services (Charvat W. C., 2000).

Clients are motivated to implement the procurement process when they do not have enough resources or expertise to implement the project. Usually, architect are selected to provide advice regarding the procurement method of the project, identify the procurement method risk, cost and time. But in reality, the competitors in the construction procurement market argue that architect is not suitable for procurements work (Charvat W. C., 2000). According to Ashworth A. (2013), initially, in order to construct a project, client will invariably commission a designer and normally an architect will responsible for architecture work and civil engineer will responsible for civil work. Besides these two important parties, there have one more party that will influence the successful of project, which is quantity surveyor. Usually, Quantity surveyor will responsible to the contract and procurement work which they will prepare estimation of budget, tender documents and contract document.

According to Building C. I. (2011), procurement can consider as the process of identification, selection and accreditation of the contributions required for the execution phase of the project. Different organization has different alternative method of procurement process to reflect the appropriate contribution. But the several of procurement method mean the different allocation of risk and responsibility to achieve the project's goals. In order to select the best method for project procurement process, it should consider the characteristic of the project, and the project and client requirement.

Procurement process is an important process/procedure to every project. This is because every project is depending on the purchasing of raw materials and machinery in order to execute the project (El-Reedy M., 2011). In order to achieve specific objective and goals of the project, it is necessary to prepare systematic process in order to create relation with external suppliers. In addition, execution phase of the project can be effective with the early define the purchasing strategies as well as the characteristics of the contract and determine the systematic way to monitor and tracking the procurement process. Besides that, it is also necessary to consider the quality of the product and services provided by the suppliers.

2.2.1 Procurement Process

According to Charvat W. C. (2011), the scope of procurement work will be affected by the contract types, the numbers of contract, the duration to awards the contract and the use of fast-tracking system. Charvat W. C. stated there have five basic steps that involved in the construction procurement process, which are:

(i) Plan procurement

In this step, the preparation for bidding and negotiation will start. It includes the decision in selecting the project procurement method and determining the structure, award system, payment system and duration of the contract. In addition, this step also will involve the make or buy decision, make or buy decision is making decision whether the work is implement in-house or outsourcing.

(ii) Identify the pre-qualification sellers

Identify and prepare pre-qualification sellers list based on selection criteria such as company's reputation, financial flow, skill and knowledge, performance's quality and company's experiences. Evaluate the sellers by based on the selection criteria can help the project to meet the appropriate standard.

(iii) Prepare bidding documents

Bidding documents should be prepared based on the client's requirement such as types of contract and the characteristics of the sellers. The bidding document will include the details information about the project and define the term and condition that include in the contract, advertisement for sellers, instruction to the seller, contract/agreement form, drawing, specifications and others.

(iv) Receipt of Bids

The construction procurement often using open tendering, close tendering and negotiate tendering in order to select the potential sellers. Observing the proper protocol is essential to prevent bid protest. The selection decision is based on decision of the project's client and normally will assists by project manager or architect.

(v) Award the contract

Contract will award to the sellers that win the bids. Procurement consultant such as quantity surveyor, project manager and architect will prepare the documents for any modification and change in the contract. The project's client and sellers should sign the contract as agreement.

2.3 PROCUREMENT METHOD

According to Ashworth A. (2013), the procurement process is the one of the elements that helping the successful of construction project. Each construction project has own variables in order to determine the choice of procurement method. The selected procurement method should provide the most advantageous for project and client. It also needed to ensure that the selected procurement will performed the project on time, on budget and on the require specification. Other than that, in order to choose the appropriate procurement method, there have some matters that need to consider such as bidding document, bidding procedure, seller's bid evaluation criteria, the risk level for both client and contractor, solution for the risk, contract types and payment system (Sutt J., 2011).

According to Building C. I. (2011), the construction procurement method can be classified into four types, which are traditional/conventional method, design and build method, management contracting and construction management. Not all method is the best because each method has their own advantages and limitation. Each method has brought different level of risk to the construction project. Therefore, the selection of procurement method should consider all aspect require by project and project team.

2.3.1 Traditional / Conventional Procurement Method

Traditional procurement method has been used for at least past 150 years by project's client of the construction industry (Squires B. G., 2011). According to Sutt J. (2011), in the traditional procurement method, the client will enter into the contracts separately with architect and contractor. The architect will responsible for design work, while contractor will responsible for construction work. The traditional procurement method has been identified as the slowest delivery method due to their sequential approach. By using the traditional method, the project design phase should finish before the constructions phase of the project begin. Since the pre-contract phase of this method is longer, the project's client and project team have more time to review and correct the project design before construction is start.

Traditional procurement method provides more price certainty to the client at the every phase of the project. It can reduce any design and construction uncertainty which often causes the contractor to unnecessary increase the project cost. Cost of project will be more lower when use the bill of quantities to bid the tender. According to Building C. I. (2011), usually the contractor will be paid based on fixed price or by lump sum price of the project and work for within the time period for lump sum payment. In terms of quality, traditional procurement method also provides high level of quality and functional certainty. This is because the method gives the client opportunity to integrate the parties that have expertise for working together such as best architect and best contractor.

According to Peter D. et al (2008) and Sutt J. (2011), the advantage of the traditional procurement method is the project's client is able to have full influences toward the overall process of the project. This action can increase the quality and functionality of the project. Other than that, best quality of project is guarantee when the building contract attached with the bill of qualities and project specification. Traditional procurement method is easy to develop the project and arrange, manage and evaluate the effect of change and reduce the number of contract conflict. In addition, it having balanced allocation of risk between project's client and contractor compare to design

and build method. It also known as tried procurement method because it have been tested in the long term period and is a very familiar procurement method.

Meanwhile the disadvantages of using traditional procurement method are it can lead to the contract conflict about the defects whether the defects are in design or defects are in materials and labour, this is due to separation between design and construction work. In addition, the overall duration of the project may longer than other project procured under others procurement method because the process or traditional method is sequential. Besides that, project's client can't tender a specific contractor until the project's design is finalized and can cause the time consuming and project duration longer (Peter D. et al., (2008) and Steven Y. (2011)).

2.3.2 Design and Build Procurement Method

Design and build procurement method is a one of procurement methods which contractor is responsible to carry out both design and construction work of the project (Ogunsanmi O. E. et al, 2011). Due to unsatisfied with traditional procurement, many project's client now are choosing design and build method for their procurement process because project completion time is fast, can reduce project cost and single responsibility roles. In addition, contractors are interest to design and build procurement because it allows them to use the relationship with project's client to get more percentage of construction prices. Furthermore, design and build procurement is flexibility in term of money such as profit.

According to Peter D. et al (2008), in design and build procurement, contractors are responsible for some or all of the design work. As a single organization responsible for design and construction work, the contractors are able to control time and the overall of the project's design. In the design and build procurement, level of design liability should be clearly stated. Usually, the liability of the design is incurred under the contractor, unless was stated in the clause of contract. The design and build procurement also known as fast tracking method (Thomas J. et al, 2005). Design and build procurement is consider as fast tracking method because project delivery system are integrated between design work and construction work. The close integration

between both activities and overlap of both activities ensure the quicker of project implementation.

Design and build procurement provides certainty on the contract sum and benefit in term of cost. Normally, price for design and build method are fixed at the tender stage and changes are not allowable, unless instructed by client. Project's cost can save if the contractors are expertise and experience to design and construction work. In term of quality, the quality of project will good when the contractor utilizes their expertise and experience to develop more effective and efficiency project control system. It also allow contractor to be innovative in improve the project process and technique used. Sometimes, the quality of project procure under design and build project are not good because lack or manage and control of client due to client lose their influence in the design work and construction work.

2.3.3 Management Contracting Method

According to Jeremy G. (2014), the management contracting method is one of the procurement methods where the contractors are contract to carry out the work through work contractors position and at the same time contractually responsible as management contractor. Normally, project's client will engaged with management contractor in order to manage the early phase of the project because management contractor usually is an expertise and experience contractor. Management contracting method is an effective method for client to maintain control toward design work while seeking on the experience of construction specialist. Nowadays, this method becomes more popular in some areas and popular on the mega project.

According to Consult R. (2014), the design work in management contracting project will responsible by consultant of the project's client. Otherwise, management contractor is responsible for defining work packages and determine the systematic procedure to carry out the work package. Usually, management contractor are not contract to undertake the construction work but manage the process of the work. Therefore, all the construction work will contract to subcontractors and directly contract under management contractor. The roles of project's client on this types of method is